Lecture 6: Architecture of Computing cloud

https://sites.google.com/site/clustergateorg/

- Definitions
- Difference of approaches Grid and Cloud
- Cloud model
- References:
  - http://en.wikipedia.org/wiki/Cloud_computing
  - http://en.wikipedia.org/wiki/Cloud_computing_comparison

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Cloud computing systems

- In general cloud architecture assumes that there is large pool of computing resources which might be used by demand. The system has shared and reconfigured architecture (I.e communication channels, memory, storage, servers, applications, and services can be given to customer and made free, when customer does not need for them anymore).
- Cloud model has *five important characteristics*, *three service models,* and *four models of deployment*.

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5 characteristics

- Access by demand in selfservice mode.
- High capacity channels.
- Large pool of resources (CPUs, memory, enc) in spite of geographic allocation of the resources. Total volume of any resource is much higher that one demand.
- Flexibility.
- The resources might be measured in according to the level of consumption.

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3 service models

- Software as a Service (SaaS).
- Platform as a Service (PaaS).
- Infrastructure as a Service (IaaS)
  - Customer can rent the time of communication channels, CPUs, memory, storage, other components.
  - Any cloud service usually has to be based on lower cloud layer.

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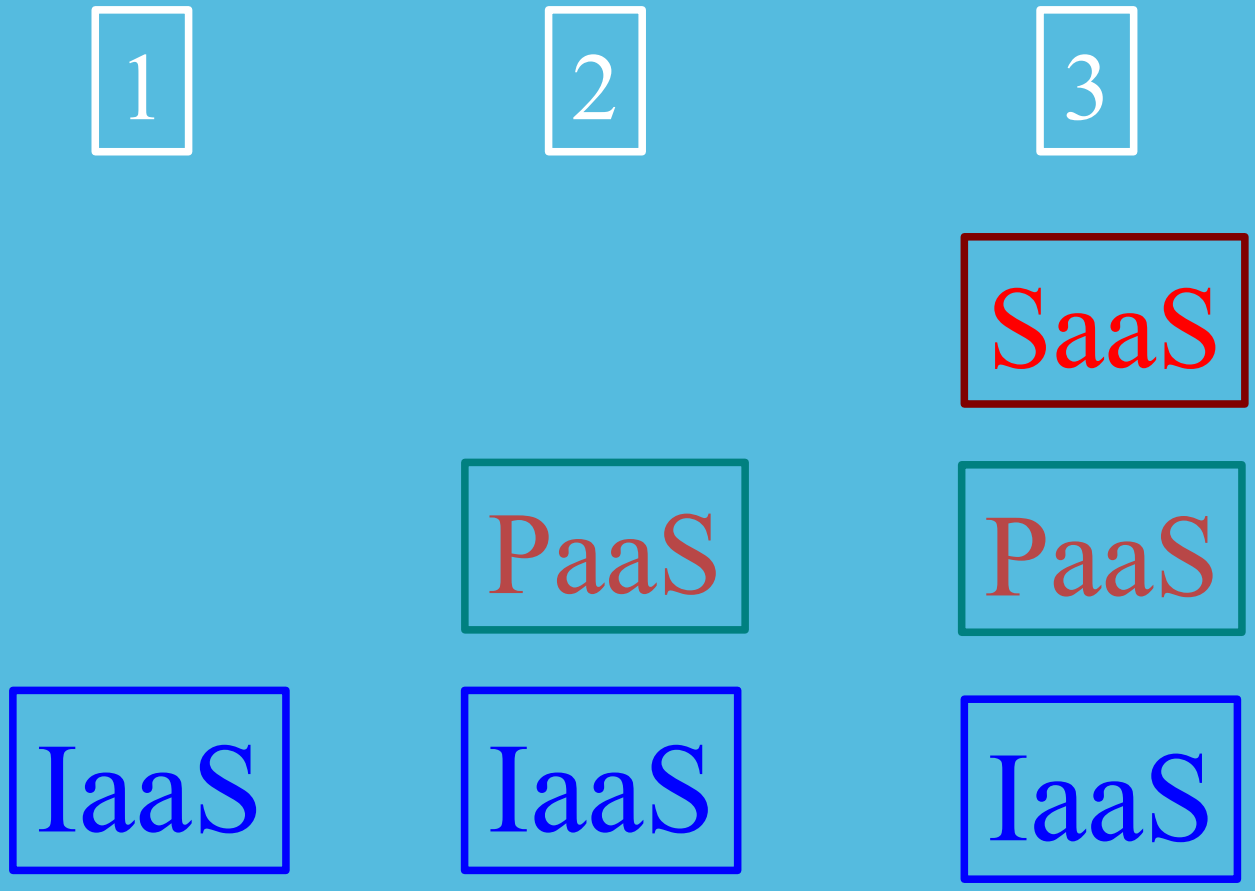
Service models



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4 deployment models

- Private cloud (just one organization uses the cloud for theirs needs).
- Society cloud (several organization deployed and use the cloud).
- Public cloud (the cloud is open to be used by anybody for some fee).
- Hybrid cloud (combination of any above cases).

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Cloud characteristics

- **Cloud architecture usually has following features:**
  - Large scale
  - (almost) homogeneous
  - Virtualization
  - Flexible organization
  - Inexpensive software (FOSS)
  - Geographically distributed
  - Service oriented.
  - Advanced Security.

Examples for public clouds

- Amazon.com/ec2 - Amazon Elastic Compute Cloud (Amazon EC2)
- http://www.rackspace.com/ RackSpace
- Dropbox.com
- Box.com
- Adrive.com
- http://www.oracle.com/technetwork/topics/cloud/whatsnew/index.html
-

Software planform for clouds

- http://www.eucalyptus.com/ - Eucalyptus
- http://www.opennebula.org/ - Nebula
- http://www.nimbusproject.org/ - Nimbus
- http://www.Openstack.org - Openstack

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Questions about clouds

- How safe my data in cloud ?
- Who is reponsible if my data disappeared ?
- How much resources do I need to order in cloud?
- What is the speed of performance in cloud (how to compare one cloud speed with other cloud speed) ?
- What is scalability in cloud ?

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End of Lecture

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